Operating Manual for Model ~~E~~ E/IN-2X Audio Oscillator

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1. General

The Model E/IN-2X Audio Oscillator is a self-contained battery-operated device supplying a pulse output wave form of 30 to 3000 cycles per second in two bands. This oscillator was designed to occupy the smallest possible volume and still meet the necessary functional and frequency stability requirements. The dial does not indicate the frequency directly but covers a numerical range of 000 to 999. A calibration curve for each unit must be used to obtain the actual frequency.

Two output jacks are provided so that an ear piece and a recorder can be used at the same time.

2. Operating Instructions

2.1. Controls and Terminals

OFF

This switch is fastened to the AMPLITUDE control and connects and disconnects the battery from the KEY button. This switch does not apply power to the oscillator but it prevents the battery from being discharged if the KEY button is accidentally pressed while the instrument is being carried or stored.

RANGE

This toggle switch changed capacity values in the frequency determining circuit of the instrument. The position of this switch determines whether the output frequency range is 30 to 300 cycles per second or 300 to 3000 cycles per second.

AMPLITUDE

This control is a potentiometer that is used to vary the amount of oscillator voltage that is applied to the OUTPUT jacks.

COUNTER

THIS

FREQUENCY
~~Frequency Dial~~

This control varies the resistance in the frequency determining circuits of the instrument, and thus varies the frequency. This CONTROL ~~dial~~ turns the COUNTER ~~a counter~~ from 000 to 999. If the RANGE switch position is known the actual frequency can be obtained from the "DIAL reading" ~~Dial Number~~ vs. "Frequency" curve supplied with the instrument.

OUTPUT

The output PULSE SIGNAL ~~voltage~~ of the instrument appears at these jacks.

KEY

This button connects the battery to the oscillator. The AMPLITUDE control must be turned on before the KEY button will function. Pressing this button causes the SIGNAL ~~voltage~~ to appear on the OUTPUT jacks.

2.2. Operation of the Instrument

The procedure for the correct operation of this oscillator is as follows:

a. Remove the large ~~xxxx~~screw on the side of this case. This screw releases the side ~~battery~~ for removal of the batteries. cover ~~so that it may be removed~~.

b. Place two 22.5 volt Eveready 505E or Burgess Y15 dry batteries in the battery holder inside the case. The correct battery polarity is marked on the case.

c. Rotate the ~~xxxxxxxxx~~AMPLITUDE control 270 degrees clockwise. This will connect the battery to the KEY button and at the ~~xxx~~same time place the maximum oscillator voltage amplitude across the OUTPUT jacks when the KEY button is pressed.

d. Place the ear peice in one of the two OUTPUT jacks.

e. Press the KEY button and a signal ~~will~~ should be heard in the ear piece.

f. Set the AMPLITUDE control so the instrument is delivering the desired amplitude to the ear ~~p~~piece and/or recorder.

g. Set the Frequency Dial and the RANGE switch to the desired frequency.

2.3. Power Supply (Self-Contained)

a. Type: Dry battery. Eveready 505E or Burgess Y15 22.5 volt.

b. Life: Power is required only during the time that the KEY button is pressed. Under these conditions the battery will have exceptionally long life. This battery will power the instrument ~~xxxxxxxxxx~~continuously for a minimum of discharge A period of ~~48~~ hours was required to ~~run the~~ 10 hours, ~~and on a 10 second cycle "on" 10 second "off"~~ the battery with a cycle of 10 seconds "on" and 10 seconds off. ~~basis the battery can be used for a minimum of 48 hours.~~

To determine whether the battery is discharged, adj ust

the frequency of oscillation to 3000 cycles per second. Listen to the ear piece and if a frequency changes can be detected by the ear when the KEY button is depressed then the battery should be replaced.

3. Circuit Description

This is a relaxation type of oscillator making use of a General Electric Unijunction Silicon Transistor. Resistor R_1 & R_2 (see figure →) determines the time required for the condenser C to charge. When the voltage across C reaches a certain value the forward resistance of the transistor junction reduces to a very low value discharging the condenser. The condenser then charges thru R_1 + R_2 again and the cycle is repeated. The frequency is varied by changing the value of R_1.

4. Specifications

a) Frequency Range: 30 to 3000 cycles per second in two bands

1. 30 to 300 cps

2. 300 to 3000 cp s

b) Frequency Stability: Better than ± % betw een an ambient temperature range of 0 degrees C to 50 degrees Cx (Includes calibration error and battery voltage change of ~~45 to 30~~ 22.5 volts).

c) Output Wave Form: Pulse.

d) Power Supply: ~~45~~ 22.5 volts at ~~1.5~~ 3 ma. maximum. This current varies somewhat with frequency.

e) Weight: 16 OUNCES

f) Dimensions: 5 × 2 7/8 × 1 3/16 inches over-all

5. Maintenance

Each one of these oscillators has been individually adjusted and calibrated. For this reason no repairs should be attempted in the field. If the unit fails it should be returned to the laboratory for rep air.

Battery replacement is the only field maintenance required.